

**WHAT IS CLAIMED IS:**

1. An antenna space time transmit diversity method, comprising:

providing an original block of bits having first and second parts;

5 modulating the original block of bits with a carrier signal to produce a modulated block of information having first and second parts that respectively correspond to said first and second parts of said original block of bits;

producing a further block of information including first and second parts which respectively correspond to the first and second parts of the modulated block and which

10 are respective complex conjugates of the first and second parts of the modulated block; and

using first and second antennas to respectively transmit the modulated block and the further block over a wireless communication link such that the first part of the modulated block is transmitted in timewise correspondence with the second part of the further block and the second part of the modulated block is transmitted in timewise correspondence with the first part of the further block.

15 2. The method of Claim 1, wherein one of the parts of the further block is a negative complex conjugate of the corresponding part of the modulated block.

3. The method of Claim 1, wherein said providing step includes providing the first and second parts of the original block in parallel, and wherein said modulating step includes modulating the first and second parts of the original block in parallel.

4. The method of Claim 1, wherein said demodulating step includes one of  
5 FSK and GFSK demodulating.

5. A method of determining an original block of bits from first and second antenna signals received via a wireless communication link, comprising:

producing a received block of information from the first and second antenna signals;

10 complex conjugating first and second parts of the received block to produce first and second complex conjugate parts; and

combining the first and second parts and the first and second complex conjugate parts and fading parameter information indicative of first and second estimated fading parameters respectively associated with the first and second antenna signals to produce a  
15 combined result that is representative of the original block of bits.

6. The method of Claim 5, wherein the fading parameter information includes a complex conjugate of the first estimated fading parameter and also includes the second estimated fading parameter.

7. The method of Claim 5, wherein said combining step includes multiplying the first and second parts by a complex conjugate of the first estimated fading parameter to produce first and second products, respectively, and multiplying the first and second complex conjugate parts by the second estimated fading parameter to produce third and fourth products, respectively.

8. The method of Claim 7, wherein said combining step includes adding the first product to the third product to produce a first received part, and subtracting the fourth product from the second product to produce a second received part, said combined result including the first and second received parts.

9. The method of Claim 8, including demodulating the first and second received parts to produce a demodulated result, and making a determination that the demodulated result is the original block of bits.

10. The method of Claim 9, wherein said demodulating step includes demodulating the first and second received parts in parallel to produce first and second constituent parts of the demodulated result.

11. The method of Claim 9, including formatting the first and second received parts into a further block, said demodulating step including demodulating the further

block to produce a demodulated block, said making step including making a determination that the demodulated block is the original block of bits.

12. The method of Claim 9, wherein said demodulating step includes FSK demodulating.

5 13. The method of Claim 9, wherein said demodulating step includes GFSK demodulating.

14. An antenna space time transmit diversity apparatus, comprising:  
an input for receiving an original block of bits having first and second parts;  
a modulator coupled to said input for modulating the original block of bits with a  
10 carrier signal to produce a modulated block of information having first and second parts  
that respectively correspond to said first and second parts of the original block of bits;  
an encoder coupled to said modulator for receiving the modulated block of  
information and producing therefrom a further block of information including first and  
second parts which respectively correspond to the first and second parts of the modulated  
15 block and which are respective complex conjugates of the first and second parts of the  
modulated block; and

first and second antennas respectively coupled to said modulator and said encoder  
for respectively transmitting the modulated block and the further block over a wireless

communication link such that the first part of the modulated block is transmitted in timewise correspondence with the second part of the further block and the second part of the modulated block is transmitted in timewise correspondence with the first part of the further block.

5        15.      The apparatus of Claim 14, wherein one of the parts of the further block is a negative complex conjugate of the corresponding part of the modulated block.

16.      The apparatus of Claim 14, wherein said demodulator includes one of an FSK demodulator and a GFSK demodulator.

10        17.      The apparatus of Claim 14, wherein a portion of said encoder is provided in said demodulator.

18.      The apparatus of Claim 14, provided as a Bluetooth device.

19.      The apparatus of Claim 14, wherein said modulator is operable for modulating the first and second parts of the original block in parallel.

20.      A wireless communication apparatus, comprising:

15        a wireless communication interface for receiving from a wireless communication link first and second antenna signals that represent an original block of bits, said wireless communication interface operable for producing a received block of information from said first and second antenna signals;

a complex conjugator coupled to said wireless communication interface for complex conjugating first and second parts of the received block to produce first and second complex conjugate parts; and

a combiner coupled to said complex conjugator and to said wireless

5 communication interface and having an input for receiving fading parameter information indicative of first and second estimated fading parameters respectively associated with the first and second antenna signals, said combiner operable for combining the first and second parts and the first and second complex conjugate parts and the fading parameter information to produce a combined result that is representative of the original block of  
10 bits.

21. The apparatus of Claim 20, wherein the fading parameter information includes a complex conjugate of the first estimated fading parameter and also includes the second estimated fading parameter.

22. The apparatus of Claim 20, wherein said combiner includes multipliers for  
15 multiplying the first and second parts by a complex conjugate of the first estimated fading parameter to produce respective first and second products and for multiplying the first and second complex conjugate parts by the second estimated fading parameter to produce respective third and fourth products.

23. The apparatus of Claim 22, wherein said combiner includes adders coupled to said multipliers for adding the first product to the third product to produce a first received part and for subtracting the fourth product from the second product to produce a second received part, said combined result including the first and second received parts.

24. The apparatus of Claim 23, including a demodulator coupled to said adders for demodulating the first and second received parts to produce a demodulated result and for providing the demodulated result as a determination of the original block of bits.

10 25. The apparatus of Claim 24, wherein said demodulator is operable for demodulating the first and second received parts in parallel to produce first and second constituent parts of the demodulated result.

26. The apparatus of Claim 24, including a formatter coupled between said demodulator and said adders for formatting the first and second received parts into a further block, said demodulator operable for demodulating the further block to produce a demodulated block and for providing the demodulated block as a determination of the original block of bits.

27. The apparatus of Claim 20, wherein said demodulator includes one of an FSK demodulator and a GFSK demodulator.
28. The apparatus of Claim 20, provided as a Bluetooth device.